

■ ■ ■ Smiths Power Professional Services

■ ■ Specialists in Grounding, Power Distribution,
Lightning & Surge Protection

Grounding for AC & DC Electrical Distribution Systems One-Day Training Seminar

Course Summary

This course shows how all of the key elements of grounding systems function, and emphasizes practical solutions to common problems.

A high-integrity grounding system is the single most effective means of assuring quality power distribution with a minimum of interference. This practical, detailed look at grounding covers the earth ground electrode system, lightning protection, a full range of both AC&DC grounding systems, ESD and RFI considerations and an introduction to Surge Protective Devices.

Who Should Attend

This seminar is designed for those with a working knowledge of both AC&DC power systems.

What to Expect

The course is led by an experienced instructor. Our instructors are active in numerous professional organizations including: IEC, IEEE, ANSI, NEMA and UL Advisory.

The class meets from 8 am to 5 pm. Each student will receive a text specific manual, including charts and graphs discussed during the presentation.

Accredited for 0.8 CEU accreditation through the University of Idaho

COURSE OUTLINE

Section 1: Earth Ground Electrode System (Approx. 70 min)

- Grounding Electrode System Components
- Sizing the Grounding Electrode Conductor
- Effects of Soil Resistivity
- Grounding Electrode System Techniques
- Earth Ground Resistance Testing
- Multiple Ground Violation

Section 2: Grounding For Lightning Protection (Approx. 70 min)

- Types of Systems (Conduction, Attraction, Dissipation)
- Design and Installation
- Lightning Ground Impedance
- Bonding Requirements

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Section 3: AC Grounding Practices (Approx. 70 min)

- Safety Ground Considerations
- Fault Currents
- Touch Safety
- NEC Requirements
- Sizing the Neutral for Linear and Non-Linear Loads
- European Ground/Neutral Protection Systems

Section 4: Computer Room Grounding Considerations (Approx. 70 min)

- System Ground (Logic Zero Reference)
- Grounding Techniques for Reliable Equipment Performance
- Proper Neutral-Ground Bonding
- Sizing Wire to meet Computer Industry Standards
- Effect of Unbalanced Loads
- Grounding Line Treatment Devices
- Transient Overvoltage Protector Grounding

Section 5: DC Grounding Practices (Approx. 60 min)

- Central Office Ground Field
- Master Ground Bar (MGB)
- Isolated Ground Zone (IGZ)
- Non-Isolated Ground Zone
- Main Distribution Frame
- Entrance Cables

Section 6: ESD and EMI/RFI Grounding Practices (Approx. 70 min)

- Triboelectric Charging
- Surface Resistivity
- Discharge and Decay
- Human Body as a Conductor to Ground
- Humidity Control
- Work Surfaces
- Coupling
- Signal Reference Grids
- Skin Effect
- Impedance of Round Conductors
- Bonding and Shielding

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Section 7: Data Line and Instrumentation Grounding (Approx. 70 min)

- Low Frequency Shield Grounding
- High Frequency Shield Grounding
- Coaxial Cables
- Cable Terminations
- Cable Grounding for Multiple Buildings
- Proper Grounding of Transient Overvoltage Protectors
 - Dial-up Telephone Lines
 - Leased Lines
 - RS-232 Data Interfaces

About Smiths Power Professional Services

Smiths Power is a leading supplier of power distribution, conditioning, protection and monitoring solutions for data centers, wireless communications and other mission-critical or high-value electrical systems. Through the Professional Services arm, Smiths Power helps organizations with:

- **Site Audits** – Grounding, Power, Surge Protection, and Physical Lightning Protection systems. Comprehensive inspections to industry standards and engineering best practices.
- **Consulting** – Design review and expert consultation on grounding, power distribution, and protection systems.
- **Training** – Accredited classroom and hands-on training in a range of topics related to our area of expertise: grounding, power, and protection. We offer courses open to the public and **in-house training for private groups upon request**

As a family of brands, PDI, ONYX, PolyPhaser, Transtector, LEA, and RO Associates unite under one umbrella to Transform, Distribute, Monitor and Protect™ power in global networks and systems. The Smiths Power companies provide expertise in consulting, design and manufacturing of power transformers and distribution systems, static switching, power monitoring, RF, AC, DC, data signal and EMP protectors, as well as power quality engineering services. For more information, visit www.smithspower.com.